

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
12 February 2004 (12.02.2004)

PCT

(10) International Publication Number
WO 2004/013280 A3

(51) International Patent Classification⁷: **C12Q 1/68**,
C12P 19/34, C12N 15/63, 15/88, C07H 21/02, 21/04,
A01N 43/04

(21) International Application Number:
PCT/US2003/016887

(22) International Filing Date: 26 May 2003 (26.05.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/212,322 5 August 2002 (05.08.2002) US
10/322,086 17 December 2002 (17.12.2002) US
10/430,351 5 May 2003 (05.05.2003) US

(63) Related by continuation (CON) or continuation-in-part
(CIP) to earlier application:
US 10/430,351 (CIP)
Filed on 5 May 2003 (05.05.2003)

(71) Applicant (for all designated States except US): **UNIVERSITY OF IOWA RESEARCH FOUNDATION** [US/US];
100 Oakdale Campus, 214 Technology Information Center,
Iowa City, IA 52242-5000 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DAVIDSON, Beverly, L.** [US/US]; 3640 Johnson Way N.E., North Liberty, IA 52242 (US). **GONZALEZ-ALEGRE, Pedro** [US/US]; 1930 Calvin Avenue, Iowa City, IA 52246-3100 (US). **MILLER, Victor** [US/US]; 1220 3rd Avenue, Iowa City, IA 52240-2011 (US). **PAULSON, Henry** [US/US]; 416 North Linn Street, Iowa City, IA 52245-2155 (US). **HARPER, Scott** [US/US]; 1 Warwick Circle, Iowa City, IA 52240-2847 (US).

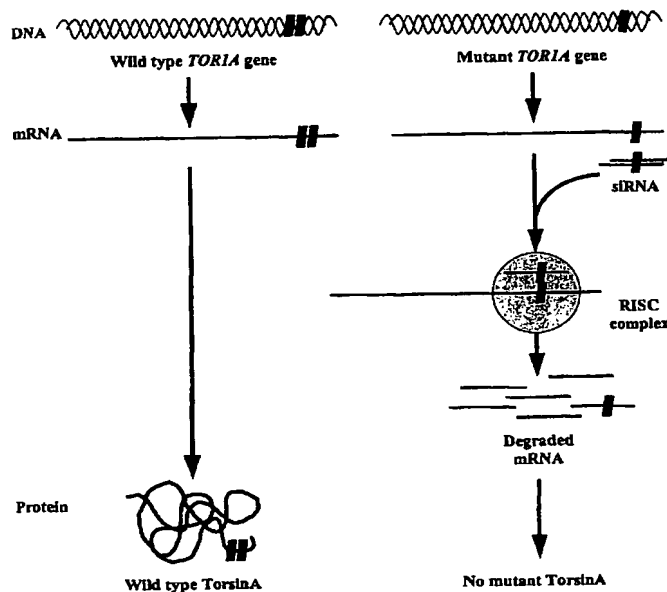
(74) Agent: **VIKSINIS, Ann, S.**; Fish & Richardson P.C., P.A., 60 South Sixth Street, Suite 3300, Minneapolis, MN 55402 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: **ALLELE-SPECIFIC siRNA-MEDIATED GENE SILENCING**



(57) Abstract: The present invention is directed to small interfering RNA molecules (siRNA) targeted against an allele of interest, and methods of using these siRNA molecules.



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
29 December 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US03/16887

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12Q 1/68; C12P 19/34; C12N 15/63, 15/88; C07H 21/02, 21/04; A01N 43/04

US CL : 435/6, 91.1, 91.31, 455, 458; 536/23.1, 24.5; 514/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6, 91.1, 91.31, 455, 458; 536/23.1, 24.5; 514/44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
West, Dialog, STIC sequence search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,387,616 (ORZELIUS et al.) 14 May 2002 (abstract, col. 1, 7, 12-14, 17, 51-52, SEQ ID NO. 24).	1-17, 25-27
Y	FIRE, A. et al., Potent and specific genetic interference by double stranded RNA in <i>C. elegans</i> , <i>Nature</i> , Vol. 391, pages 806-811, Feb. 19, 1998, esp. at p. 806-7, fig. 1 on p. 808 and Table 3 on p. 809).	1-17, 25-27
Y	US 5,902,880 (THOMPSON) 11 May 1999 (col. 6-11, claims 11-16, 19-24).	1-17, 25-27
Y	US 2002/0086356 (TUSCHL et al.) 4 July 2002 (p. 8, fig. 14b, pp. 10, 27, 28).	3-8

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

14 September 2005 (14.09.2005)

Date of mailing of the international search report

31 OCT 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Authorized officer

Jane Zara

Telephone No. (703) 308-0196

Facsimile No. (703) 305-3230

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/16887

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 18-24 and 41-60 were not searchable because they were multiply dependent claims.
2. ☐ Claim Nos.: 18-24 and 41-60
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-17, 25-27 and 61-81

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.